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EXTENDING THE LENGTH OF SERVICE
OF SOVIET V-2 DIESEL MOTORS

Guards Engr-Col A. Korshunov

A number of factors affect the life of V-2 diesel motors, and among these the method of operating the motor is especially significant. Let us consider several of the most important operational factors.

In our practical work with tanks, we always devote special attention to the cooling system of the diesel motor. Disruption of the normal operation of the cooling system is especially dangerous in spring and summer, when outside temperatures are high. Possible overheating of the diesel motor can lead to serious damage or breakdown of the engine.

When the motor is not properly cooled, the oil thins out rapidly and loses its normal viscosity. This inevitably increases the coefficient of friction in linked parts and lowers the pressure in the lubricating system. Engine power drops, and a considerable part of it is wasted in overcoming internal resistance. Seizing of the pistons, melting of the main and connecting rod bearings, and other forms of damage to cylinder sleeves and block may occur.

In winter and in the period of spring frosts, there are instances where engines are overcooled. Protracted operation of an overcooled engine is no less dangerous than running an overheated one. Protracted operation of the V-2 tank diesel motor at lowered temperatures (when the temperature of the cooling fluid is lower than plus 40-45 degrees centigrade) will cause gum formation on the piston group. Moreover, an overcooled engine develops less power. Gum formation on the pistons and cylinders, if not checked in time, may make major repairs necessary.

For this reason, we insist on constant checking of the cooling system by our driver-mechanics and by all officers of the technical services. In preparing equipment for spring and summer operations, all scale is removed from the cooling system, and all dust and dirt are cleaned and blown out from the surfaces of the radiator and water jacket.

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To avoid overcooling, forced warmup of the engine is used widely. To prevent overheating in field operation of the tank, the driver-mechanic keeps the temperature of the water in the cooling system constant by using the correct gears for various road conditions. When the outside temperature is high, constant, normal temperature of the water in the cooling system is achieved by regulating the opening of the louvers over the motor and the ports over the ventilator.

The rules for operating the fuel system are observed meticulously in our practical work.

There are instances in which filtration of the diesel fuel is neglected when filling the fuel tanks, with the excuse that existing methods of filtration are imperfect. However, filtration through a silk cloth, though time-consuming, removes mechanical impurities and water from the fuel. Neglect of this simple step increases wear on the precision parts of the fuel pumps and injectors, parts of the piston group, and the working surfaces of the cylinder sleeves.

In the lubricating system of the V-2 diesel motor, oil is pumped to all friction parts from an oil tank through a complex system of oil lines. However, the oil is not supplied to all parts in the same quantity and under the same pressure. Thus, while oil is fed to the main bearings under a pressure of 7-8 atmospheres, by the time it reaches the seventh and eighth support bearings, the pressure falls two to three times as a result of leakage through gaps and drawing-off of oil from the main line.

It must also be kept in mind that when the engine stands idle for a long time, very little oil is kept on its friction parts since the oil either flows into the crankcase or is forced out by the weight of the part. This is especially true of the main and connecting-rod bearings and the working surfaces of the cylinder sleeves. If special measures are not taken in the process of starting and warming up the motor, intensified wear of the most important friction parts will take place, and the life of the motor will be considerably shortened. For this reason, it is especially important to supply sufficient oil at the required pressure to the above-mentioned friction surfaces when preparing to start the motor and immediately after starting.

A hand oil pump has proved useful for creating a preliminary pressure of 0.5 to 1 atmosphere in the main supply line of the motor. However, double pumping has proved even more effective in lengthening the life of the motor.

In this method, the oil is first pumped up by hand to a pressure of one atmosphere. Then the driver turns the motor over several times with the starter. Since the pressure in the oil system drops when the motor is turned over, the oil is pumped up again. Then the motor is started.

By applying all the necessary measures for the care and servicing of the fuel, cooling, and air-cleaning systems, we have considerably lengthened the between-repairs period of military machines.

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